



Climate and environmental change in arid Central Asia: Impacts, vulnerability, and adaptations

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Abstract:

Vulnerability to climate change and other hazards constitutes a critical set of interactions between society and environment. As transitional economies emerging from the collapse of the Soviet Union, the republics of Central Asia are particularly vulnerable due to (1) physical geography (which dominated by temperate deserts and semi-deserts), (2) relative underdevelopment resulting from an economic Focus on monoculture agricultural exports before 1991, and (3) traumatic social, economic, institutional upheavals following independence. Aridity is expected to increase across the entire Central Asian region, but especially in the western parts of Turkmenistan, Uzbekistan, and Kazakhstan. Temperature increases are projected to be particularly high in summer and fall, accompanied by decreases in precipitation. We examine the concepts of vulnerability, adaptation, and mitigation in the context of climate change in Central Asia. We explore three major aspects of human vulnerability-food security, water stress, and human health-and propose a set of indicators suitable for their assessment. Non-climatic stresses are likely to increase regional vulnerability to climate change and reduce adaptive capacity due to resource deployment to competing needs. (C) 2009 Elsevier Ltd. All rights reserved.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

Special Report on Emissions Scenarios (SRES) Scenario: SRES A1, SRES A2, SRES B1, SRES B2

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Quality, Food/Water Quality, Food/Water Security, Food/Water Security, Precipitation, Temperature

Extreme Weather Event: Drought, Flooding, Landslides

Food/Water Quality: Chemical, Chemical, Other Water Quality Issue

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Water Quality (other): Salinity

Food/Water Security: Agricultural Productivity, Food Access/Distribution, Livestock Productivity, Nutritional Quality

Temperature: Extreme Heat, Fluctuations

Geographic Feature: 

resource focuses on specific type of geography

Desert

Geographic Location: 

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Region

Other Asian Region: Central Asia

Health Co-Benefit/Co-Harm (Adaption/Mitigation): 

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: 

specification of health effect or disease related to climate change exposure

Infectious Disease, Injury, Morbidity/Mortality, Other Health Impact

Infectious Disease: Foodborne/Waterborne Disease, Vectorborne Disease

Foodborne/Waterborne Disease: General Foodborne/Waterborne Disease, Salmonellosis, Schistosomiasis

Vectorborne Disease: General Vectorborne, Mosquito-borne Disease

Mosquito-borne Disease: Dengue, Malaria

Other Health Impact: Heat stress

Intervention: 

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: 

mitigation or adaptation strategy is a focus of resource

Adaptation

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Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Policy/Opinion, Review

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Socioeconomic Scenario: SES scenarios

Timescale:

time period studied

Medium-Term (10-50 years)

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content